REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 17-26 are presently active; Claims 12-16 having been canceled without prejudice, and Claims 17-26 having been added by way of the present amendment.

In the outstanding Office Action, Claims 12 and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ushikoshi et al (U.S. Pat. No. 5,306,895) in view of Arena et al (U.S. Pat. No. 5,635,093) or Nobori et al (U.S. Pat. No. 5,616,024). Claims 13 and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ushikoshi et al in view of Arena et al or Nobori et al and further in view of Kersten et al (U.S. Pat. No. 5,919,385) or Hecht et al (U.S. Pat. No. 5,877,475). Claim 16 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ushikoshi et al in view of Arena et al or Nobori et al in view of Yoshida et al (U.S. Pat. No. 6,080,970).

Firstly, Applicants acknowledge with appreciation the courtesy of Examiner Paik to conduct an interview for this case on August 23, 2004. During the interview, the issues identified in the outstanding Office Action were discussed as substantially summarized herebelow.

The newly added Claim 17 is supported by previously presented Claim 12, Examples and Fig. 1. The newly added Claims 18 and 19 are supported at lines 15 to 16 on page 4 in the specification. The newly added Claim 20 is supported at lines 9 to 10 on page 12 in the specification. The newly added Claim 21 is supported at lines 13 to 16 on page 3 in the specification. The newly added Claim 22 is supported at lines 11 to 14 on page 4 in the specification. The newly added Claim 23 is supported at lines 26 to 28 and 32 to 34 on page 8 in the specification. The newly added Claim 24 is supported at lines 11 to 14 on page 17 and lines 27 to 28 on page 20 in the specification. The newly added Claim 25 is supported at lines

1 to 3 on page 12 in the specification. The newly added Claim 26 is supported by Fig. 1.

During the interview, the differences between new Claim 17 and the applied prior art, specifically Arena et al and Nobori et al were discussed. In particular, it was pointed out that Arena et al show in Figure 1 an arrangement of temperature measuring sensors 12 confined to one quadrant of the bed plate 4. Arena et al do not disclose or suggest the feature of at least two bottomed holes for temperature-measuring elements positioned symmetrically around the center of the ceramic plate, as discussed during the interview. Moreover, since Arena et al disclose that the bed plate 4 is made from a material having a good thermal conductivity, one skilled in the art would not be motivated to add additional temperature measuring sensors 12 to the other quadrants of the bed plate. Furthermore, it was pointed out during the interview, that although Nobori et al disclose a plurality of pits 74 for thermocouples,[1] there is no disclosure in Nobori et al that the plurality is positioned symmetrically around the ceramic substrate 72. As noted on the Interview Summary Sheet, these differences and arguments for patentability would be reconsidered and further searched.

According, Applicants submit that, in order to more precisely measure the temperature of the heating surface, the temperature-measuring element of Claim 17 is included in a bottomed hole, and the bottom portion of the bottomed hole is formed relatively nearer to the heating surface than the heating element. As such, temperature measurements can be carried out without being affected by either the atmosphere or the temperature change of the heating element.

In addition, the bottomed holes are arranged ***symmetrically around the center*** of the ceramic plate. Further, the heating element of Claim 17 is divided into at least two circuits so that each circuit can be independently controlled. With such a constitution, the temperature of the whole heating surface can be more adequately measured and controlled than when using

[1] Nobori, col. 24, line 64, to col. 25, line 3.

only one temperature measurement.

Ushikoshi et al disclose a ceramic heater having a ceramic substrate and a heating resistive body embedded in the ceramic substrate. Figure 32 shows that a thermocouple 10 is inserted in the insertion hole 56 in the ceramic substrate 4. It appears that the bottom of the insertion hole 56 in Figure 32 is located relatively nearer to the heating surface than the heating resistive body 5. However, the heating resistive body has only one circuit. Ushikoshi et al do not disclose or suggest dividing the heating resistive body into more than one circuit. With only one circuit of the heating resistive body, the temperature cannot be controlled sophisticatedly in sections. Further, since only one thermocouple is used in the ceramic heater of Ushikoshi et al, the temperature of the heating surface cannot be measured precisely.

Ushikoshi et al do not teach a ceramic substrate having at least two insertion holes (i.e., bottomed holes), arranged symmetrically with respect to the center of the ceramic substrate.

Therefore, one cannot expect from Ushikoshi et al that a temperature control can be realized by dividing the heating element into at least two circuits, arranging at least two bottomed holes symmetrically with respect to the center of the ceramic plate, and forming the bottom of the bottomed holes relatively nearer to the heating surface than the heating element.

Since Ushikoshi et al do not teach the constitution and the effect of the present invention, the ceramic heater according to the present invention is neither anticipated by nor made obvious in view of Ushikoshi et al.

The deficiencies in Ushikoshi et al are not overcome by Arena et al.

Arena et al disclose a heating plate having a bed plate with "n" zones, electrically conducting elements, and "n+l" temperature measuring sensors being positioned at ends of each zone (see Claim 1 of Arena et al). Arena et al show in Figure 1 an arrangement of temperature measuring sensors 12 confined to one quadrant of the bed plate 4. The bed plate is made from a material having good thermal conductivity such as metal, boron nitride or graphite

(col. 3, lines 30 to 35). The sensors in Arena et al are preferably thermocouples (col. 3, lines 57 to 58). Arena et al disclose that each measuring sensor is placed between the ends of two adjacent windings of conductor elements (col. 3, lines 55 to 57). However, Arena et al do not disclose or suggest that bottomed holes (and the measuring sensors) are arranged symmetrically around the center of the bed plate. Therefore, one cannot expect from Arena et al that temperature control can be realized by arranging at least two bottomed holes (and the measuring sensors) symmetrically with respect to the center of the bed plate, and forming the bottom of the bottomed holes relatively nearer to the heating surface than the electrically conducting elements. Further, as previously noted, since Arena et al disclose that the bed plate 4 is made from a material having a good thermal conductivity, one skilled in the art would not be motivated to add additional temperature measuring sensors 12 to the other quadrants of the bed plate.

Since Arena et al do not teach the constitution and the effect of the present invention, the ceramic heater according to the present invention is neither anticipated by nor made obvious in view of Arena et al and Ushikoshi et al.

Nobori et al disclose a ceramic heater having a ceramic substrate and a resistant heating element embedded within the ceramic substrate (see Claim 1 of Nobori et al). The ceramic heater shown in Figure 22b is provided with a pit 74 for positioning a thermocouple for temperature measurement. However, as noted previously, Nobori et al do not teach that at least two pits (and the thermocouples) are arranged symmetrically around the center of the ceramic substrate. Therefore, one cannot expect from Nobori et al that temperature control can be realized by arranging at least two pits (and the thermocouples) symmetrically with respect to the center of the ceramic substrate, and forming the bottom of the pits relatively nearer to the heating surface than the resistant heating element.

Since Nobori et al does not teach the constitution and the effect of the present invention,

the ceramic heater according to the present invention is neither anticipated by nor made obvious in view of Nobori et al and Ushikoshi et al.

Kersten et al disclose a cooking apparatus having a glass-ceramic plate 10, at least one heat radiator, and at least one sensor 14 arranged underneath the plate 10. As shown in Figure 2 of Kersten et al, the sensor 14 is urged against the glass-ceramic plate 30 by means of a spring 14a. However, Kersten et al do not teach about a heating element divided into at least two circuits. Further, Kersten et al do not teach to arrange at least two bottomed holes (and the sensors) symmetrically with respect to the center of the glass-ceramic plate. One cannot expect from Kersten et al that temperature control can be realized by arranging a heating element divided into at least two circuits, arranging at least two bottomed holes symmetrically with respect to the center of the glass-ceramic plate 30, and forming the bottom of the bottomed holes relatively nearer to the heating surface than the heating element.

Since Kersten et al do not teach the constitution and the effect of the present invention, the ceramic heater according to the present invention is neither anticipated by nor made obvious in view of the other applied art references and Kersten et al.

Hecht et al disclose a radiant heating body having a plate 3, a radiant heating resistor 7, and a temperature sensor 12 (see Claim 1 of Hecht et al) . The plate is a glass ceramic (col. 3, line 27). As shown in Figure 1, the radiant heating resistor 7 is 15 arranged in a spiral pattern. However, the radiant heating resistor has only one circuit. Further, only one temperature sensor is provided. Hecht et al do not disclose or suggest arranging at least two bottomed holes (and the temperature sensors) symmetrically with respect to the center of the plate.

Therefore, one cannot expect from Hecht et al that temperature control can be realized by dividing a heating resistor into at least two circuits, arranging at least two bottomed holes (and the temperature sensors) symmetrically with respect to the center of the plate, and forming the bottom of the bottomed holes relatively nearer to the heating surface than the heating

resistor.

Since Hecht et al do not teach the constitution and the effect of the present invention, the ceramic heater according to the present invention is neither anticipated by nor made obvious in view of the other applied art references and Hecht et al.

Yoshida et al disclose a wafer heating apparatus having a ceramic substrate and a heating resistor (see Claim 1 of Yoshida et al). However, the heating resistor is not divided into at least two circuits. Further, Yoshida et al do not teach to form bottomed holes in the ceramic substrate and arrange temperature-measuring elements in the bottomed holes. Therefore, one cannot expect from Yoshida et al that temperature control can be realized by dividing a heating resistor into at least two circuits, arranging at least two bottomed holes (and the temperature-measuring elements) symmetrically with respect to the center of the ceramic substrate, and forming the bottom of the bottomed holes relatively nearer to the heating surface than the heating resistor.

Since Yoshida et al do not teach the constitution and the effect of the present invention, the ceramic heater according to the present invention is neither anticipated by nor made obvious in view of the other applied art references and Yoshida et al.

As discussed above, none of Ushikoshi et al, Arena et al, and Nobori et al teach to arrange bottomed holes symmetrically with respect to the center of the ceramic substrate. Neither Kersten et al, nor Hecht et al, nor Yoshida et al remedy the deficiency of these above-noted references. Therefore, Applicants submit that the ceramic heater according to Claim 17 is not made obvious in view of the applied prior taken individually or in combination.

Hence, independent Claim 17 and Claims 18-26 dependent on Claim 17 are believed to patentably define over the applied prior art.

Moreover, regarding new Claims 18 and 19, new Claims 18 and 19 define that the temperature-measuring element is pressed on the bottom portion of the bottomed hole. While

similar Claims 13 and 15 had been previously rejected as unpatentable over Ushikoshi et al in view of Arena et al or Nobori et al and further in view of Kersten et al or Hecht et al, Applicants respectfully traverse the rejection in view of Kersten et al or Hecht et al, as Kersten et al and Hecht et al are references for stove-top cooking radiant heaters and are non-analogous teachings to the semiconductor heating apparatuses in Ushikoshi et al.

Regarding non-analogous art, M.P.E.P. §2141.01(a) quoting from *In re Clay*, 966 F.2d 656 notes that the court therein found that the inventions involved different fields of endeavors, since the reference taught the use of the gel in a different structure for a different purpose under different pressure and temperature conditions. In the present case, the heaters in the applied references of Kersten et al and Hecht et al and the heater in Ushikoshi et al involve difference fields of endeavor being used for different purposes (i.e., heaters for heating semiconductor wafers in corrosive atmospheres verses radiant heating elements for stovetop cooking, and heaters that operate in different temperature regions 300 to 1,100° C verses 0 to 506° C). Accordingly, Applicants submit that one skilled in the art of semiconductor heating apparatuses would not be motivated to utilize teachings from a radiant cooking heater reference to modify a heater in a corrosive semiconductor environment.

Besides being from different fields of endeavor, the radiant heater configurations in Kersten et al and Hecht et al place the temperature sensing elements in contact with a glass-ceramic plate ***remote*** from the heating elements unlike in Ushikoshi et al where the heating elements are in the heater body itself. Thus, only by improper picking and choosing based on Applicants' disclosure would one know which parts of Kersten et al and Hecht et al to apply to the semiconductor heater in Ushikoshi et al. The court in *In re Mercier*, 185 USPQ 774 (Fed. Cir. 1975) stated that

> The board's approach amounts, in substance, to nothing more than a hindsight "reconstruction" of the claimed invention by relying on ***isolated teachings*** of the prior art without considering ***the over-all context*** within which those teachings are presented. ***Without the benefit of appellant's disclosure***, a

> person having ordinary skill in the art would not know what portions of the disclosure of the reference to consider and what portions to disregard as irrelevant, or misleading. See In re Wesslau, 53 CCPA 746, 353 F.2d 238, 147 USPQ 391 (1965). [emphasis added]

Thus, with the applied art of Kersten et al and Hecht et al being non-analogous art to Ushikoshi et al, and without the benefit of the Applicants' disclosure to know which parts of Kersten et al and Hecht et al to consider relevant, Applicants respectfully submit that any combination rejection of Ushikoshi et al with Kersten et al or Hecht et al is improper.

For these reasons and the dependence of Claims 18 and 19 on independent Claim 17, Claims 18 and 19 are believed to patentably define over the applied prior art.

Consequently, in view of the present amendment and in light of the above discussions, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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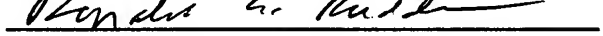

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